

REMARKS OF
THE HONORABLE DANIEL S. GOLDIN

NASA HEADQUARTERS SAFETY DAY
Thursday, May 13, 1999

Thank you for the kind introduction.

At NASA, we have a very special job to help our country to be better in the 21st century. We'll never do it unless every one of us takes care of ourselves.

It brings a story to my mind. When I was growing up, my father took me to a park. My father was a biologist who ended up sorting mail in the post office because he graduated college during the Depression, and then he went from place to place, and finally became a teacher. He was very proud of that.

One day he took me to a park, because he wanted me to understand how precious life was. I was a little malicious kid, and I was killing everything in sight: beetles, bugs, you name it. So he took me out into a park and he had me hold an insect in my hand. He talked to me about how precious and what a miracle life is.

That talk that my father had with me changed my way of thinking. I don't indiscriminately kill insects anymore. More importantly, it taught me to have respect for life. That's what drives me. And I know the management of this agency knows how intensely I feel about safety and how strongly I care about the lives of everyone at NASA and the lives they affect.

I am personally responsible for the lives of every single person who is involved with NASA. Most specifically, the employees of NASA, inclusive of our contractors and the people who may come in harm's way when our rockets and planes fly. To an extent, we are responsible for the entire people on this planet when it comes to understanding what is happening to our ozone layer, and what's happening to the purity of our air and the cleanliness of our water.

Life is very precious, and this is the one message I would like to impart. As passionately and as deeply as I feel about this, in the end, we will not achieve our goal of zero on-the-job accidents, unless each and every one of us understands how important this goal is.

We have three basic objectives at NASA. Safety is our first and most important objective. Nothing should compromise that. Nothing. Not budgets, not job assignments, not schedules,

not performance.

Our second objective is to complete the International Space Station. Our third: to develop new rockets that will improve the safety initially by a factor of 10, and then ultimately a factor of 10,000. Then we can do everything else.

The point is safety should drive everything we do. And we are doing a very, very fine job.

We've been working with the Dupont Company to learn about their safety initiatives. They're the safest company in the world and they are proud of it. It drives everything they do.

As a result, their financials are great. But they don't go for good financials. They protect their employees. Their position is, if you're safe on the job, and unsafe off the job, you don't get it. So they hold their employees accountable for being safe themselves, and for their families being safe. One of their directors told me, after he went to a training session, he changed his driving habits, because he was safe at work and he found he was unsafe driving from work to home.

Let me give you some examples of the incredible, wonderful things that you have done, and how you are making safety drive everything. Let me first start with the connection of Zarya and Unity, the first elements of the International Space Station.

They were launched in November from Baikonur in Kazakhstan, and in December from Cape Kennedy. And with just a few dozen hours, just think about it, just a few dozen hours, we integrated, assembled, checked out, and tested those two units. A few dozen hours to make the mechanical, electrical, thermal and informational system connections.

It is an unbelievable achievement, because one piece of hardware was built in Russia, and the other piece was built in America, 10,000 miles away. Those two pieces of hardware were never pre-integrated. That has never been done in the history of the space program, or for that matter, perhaps anywhere else. Just think about it -- not one accident. No one got hurt. When our contractors build spacecraft on the ground, and integrate them on the ground, thousands of hours are involved in making that happen. Now, I am not saying our contractors aren't good. I'm saying, they are outstanding for making the connection of Zarya and Unity possible. Just think about what an achievement that is.

The second issue, the Space Shuttle is an unbelievable machine. It takes off, goes to space, and comes back. There are millions of things that could go wrong, but they don't. Now, clearly it is tough and it is dangerous. Tommy Holloway, the new manager of the Space Station and former

Space Shuttle manager, said it takes tender loving care, not statistics. That means tender loving care from every one of the people who work on it. They know who those astronauts are, they are fellow coworkers. They know who their families are. They know their wives and children and husbands. And because of that the Shuttle flies safely. That's a reason to be proud.

We also have an obligation to protect the high value resources that the American public invests in. We were given a challenge, after the Mars Observer failed, to land a robot on Mars on July 4th, 1997, and have it move over the landscape. It had never been done before. It came off with pinpoint precision, because our NASA team focused on safety and quality first, and put scheduling second. The world rejoiced and we made it look easy. Sometimes the American public takes for granted how difficult it is to do what we do. They don't know the intensity with which you work. They don't understand how focused you are on giving value to them and making it as safe as possible.

Another example, the Hubble Space Telescope. It is returning incredible images and data. It is literally one of the most productive scientific instruments in the history of the human species. It is taking pictures that go right to the edge of creation, and it is rewriting everything we know about astrophysics, physics, chemistry.

For people to modify spacecraft on the ground, it takes years and thousands of hours, often by trial and error, and they often still have problems. We decided just a few years ago that we were going to fly an infrared camera. We carried a liquid that is close to absolute zero to cool down a focal point so we could look deeper into the Universe.

We didn't design the telescope for that, but we were able to retrofit this device in just a few dozen hours of on-orbit assembly. Our astronauts, our team on the ground, and many of you who tested the system before those astronauts, made it look so easy that no one appreciated how difficult and dangerous it could be. But again, we didn't launch that servicing mission until everyone bought into the fact that it was safe. Again, you folks did it.

Think of some of the routine things that happen in other workplaces, and here these folks were 300 miles above the surface of the Earth in a deadly vacuum with extreme thermal conditions, wearing space suits where you can hardly move your fingers. Yet they were prepared to successfully and safely perform these very delicate operations.

Think about the fact that NASA flies T-38 training jets for astronaut training. These planes are so old, they are older than most of the staff here -- but they're not older than I am. We service those planes to standards that are unbelievable. They don't crash. We don't have injuries. And

we have a better safety record than the places that they came from. It's unbelievable, the commitment that this agency has toward safety.

Think of all the experimental planes we fly out over the Mojave Desert. We fly F-16s, F-15s, and the SR-71. With impudence, we add all sorts of equipment to the SR-71 and test things that will go to space. At Mach 3.1, it is a very touchy plane. We wanted to hot fire the aerospike engine on it, and our folks at Dryden said, it's not safe. We're not going to fly it because it's not safe enough yet. Safety was valued over getting the data. I congratulated the Dryden team for their decision.

The other planes we fly around the country also have unbelievable safety records. And perhaps, and this is one of the things we will be talking about during this upcoming budget cycle, because our safety record is so good, we are flying some of the oldest planes in the U.S. inventory. We have the oldest Gulfstream 1. Maybe it is time to talk to the folks who control the budget and help them understand that there are certain limits. I intend to pursue this with vigor.

By pursuing safety and quality as your number one objective you make the impossible look easy. I want to tell you a little story. I talked about how you have a core responsibility to protect each other at NASA, our contractors and the people that may be in the path of the things we fly. And in certain areas, we have the charter and responsibility from our President and Congress to protect the people of the world.

It was NASA, working in cooperation with leaders in the scientific community, that did the detective work to help understand that things like hairspray and shaving cream were putting out things called chlorofluorocarbons. Through unbelievable detective work in atmospheric physics and atmospheric chemistry, and using planes, balloons and spacecraft, we were able to help solve an unbelievable puzzle that no one in the world understood. We learned that at certain times of the year, over the polar regions, with certain temperatures and humidity, the atmospheric condition occurs that generates ice crystals of a very specific geometry upon which a catalytic reaction occurs between chlorofluorocarbons and ozone.

Ozone is three oxygen atoms, O₃, and these reactions give you O and O₂. It's like Pacman. It just eats it up. And we were able to figure that out. The NASA team made it look easy and people take the discovery for granted. But as a result, we had the Montreal Protocol.

Let me explain to you why it is so important. Ozone is very special. There is a very thin shell around the Earth. If you look at pictures taken from the Shuttle you can see a very thin blue line above the Earth. A very thin blue line. That's our

atmosphere. That's all there is. It knows no boundaries of countries. It knows no politics. That's all we have to breathe. And on top of that, the stratosphere, is the ozone layer. The ozone prevents large quantities of ultraviolet radiation from reaching the surface of the Earth. Without an ozone layer your DNA could be damaged by the ultraviolet radiation and, ultimately, it could lead to cancer.

People talk about this being theoretical, but birds in South America and Australia are going blind. It affects agriculture and crops. Had we done nothing, life as we know it wouldn't be the same on this planet.

It looked so easy that no one understood the compassion and caring of what you did. You helped preserve life on this planet, because you were concerned about safety. The mission came second.

You get into a jet liner and what worries people . . . the meals are too hot, the meals are too cold . . . or the plane doesn't take off on time, and they lost my baggage. People around the world fly from point A to point B without crashing.

And that's the most important factor. Every civil plane involved in long haul transportation developed in America has gone through the NASA test facilities. The safety techniques on those planes, for the most part, were developed by NASA. And when crashes occur, the safety community comes to us to help unravel the pieces with the analytical skills we have. And even though the safety record is good, you are working on a commitment that the President and the Vice President of the United States made to the American people, to cut the crash rate by a factor of five within 10 years, and by a factor of ten within 20 years.

Safety is important. This is another place that we intersect with the American people and people around the world. They are going to share in the technologies NASA develops.

So you see, you work at a very special place. We don't do routine things. Everything we do at NASA is different. We never do the same thing. And yet, we are able to do these incredible things with regard to safety.

You may ask, why is the Administrator so concerned? Why is the Administrator so worried about safety?

I'm worried about safety because if one person dies on the job, I'm personally responsible and accountable. Remember what my father told me about my habit of killing bugs, and how precious life is. Every life is precious.

Every one of those people who could die has sisters and brothers, fathers and mothers, aunts and uncles, nieces and nephews and friends and colleagues. They are interconnected with a web of love. We've got to be conscious of it. It's got to be the

first thing on our minds.

We should appreciate that the astronauts who get into the Shuttle, their families are counting on us not to have a bad day on the job; not to be irritated about budgets; not to be upset about things; but to dedicate our total being to make sure that each Shuttle is the safest machine in the world; to make sure that each aircraft people fly in is the safest in the world; to make sure that people don't drop a cup of coffee on the floor and then walk away and have someone slip and break their neck.

Everything has to be involved in safety. And every single person has to be absolutely committed to safety and never, ever compromise

It makes no difference when we compare ourselves to other organizations and say we're safer. It doesn't make a difference -- to a person who gets hurt on the job, or disabled, or worse, killed -- that statistically we are better than everyone else. That's not good enough.

We've had a number of near misses that have given me cause for alarm. And I personally talk to every astronaut and their families before they go into space, because I want them to know how high I value their lives.

We have set some new goals for safety. Could I have the first slide? Now, if you look at this slide, it plots the frequency rate of accidents as a function of time. As you look at it, you see the worst sector is the manufacturing sector, followed by the private sector, followed by the federal agencies, on average.

Now, there are some federal agencies that don't have high-risk facilities and they're better than us. But on average, they're below NASA. Followed by the aerospace

sector, followed by NASA, but led by Dupont. Dupont has a passion where they start every meeting by talking about safety. If anyone gets hurt on the job, the chairman of the board of Dupont gets a phone call from the supervisor responsible, no matter where that chairman is, day or night, and that person tells how the accident occurred, why it occurred, and how they are going to find the root cause of that accident. Within a certain time frame, he or she has to call back and say how they resolved it. That's how serious they are at Dupont. I don't think we go that far here. That's why Dupont's on the job accident rate is almost zero.

Next slide. There are three curves here. Here is Dupont with on-the-job accidents. The similar curve for NASA is the one above it. If you include frequency rate of injuries, lost time work injuries and things Dupont and our official NASA specification don't include -- like people who have bodies of

a 50-year-old and play baseball thinking they have bodies of an 18-year-old -- it is a lot more. The difference is roughly 0.3 to 0.52. 0.3 would be 46 injuries per year. 0.52 would be 90 injuries per year. That's a lot more.

Now, take a look at where the goal is. And this is where some of my intensity came in. Within five years or six years, we want to be even with Dupont, and within six years I want us at zero. I mean zero. I mean an intensity so no one goes home killed, no one dies here, no one gets hurt here, and no one has to have a terrible experience.

This is what I would like each of you to think about. This is more important than anything you do at work, because this is the essence of what you do. Because if you live this way at work, if you live this way at home, if you talk to your families about this, think about how much richer your life could be, and will be.

This is really important stuff. You're going to see the build up of intensity on this subject, because the management of this agency doesn't just talk about caring: they really deeply care. This is the only organization in the world that operates on the surface of the Earth, in the troposphere, stratosphere, Earth orbit, and beyond. Our work place is going to be safe, not just on the surface of the Earth in our offices, but our work place is going to be safe even if we walk on Mars.

As we design future missions, we're going to design those missions with safety in mind. We're going to set up an infrastructure that will be sustaining life in a very safe way.

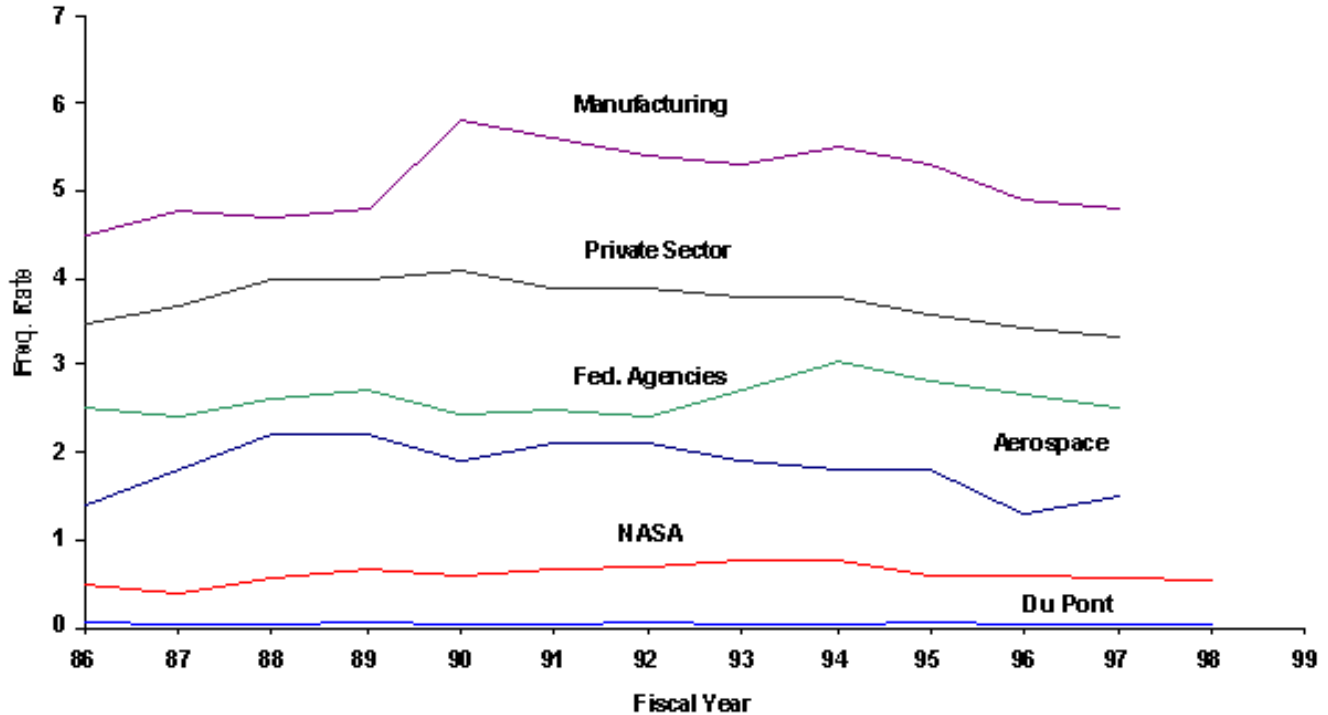
At the Continual Improvement Conference we learned about a study of 600 companies in America. The study found that companies -- big and small and medium sized -- which had the best quality and safety records, also had the highest rise in stock prices. My contention is that for everything we do in Shuttle upgrades, designing new launch vehicles, building spacecraft that will go and melt through two miles of ice on Europa and dip into an ocean on Europa, we will do it all much cheaper, much faster, with better performance if we put safety and quality first.

Dupont saves \$66 million dollars a year because they have almost no accidents and no one dies at Dupont. The bottom line, their financials are outstanding. If they find an unsafe condition, they will shut a plant down rather than let it go.

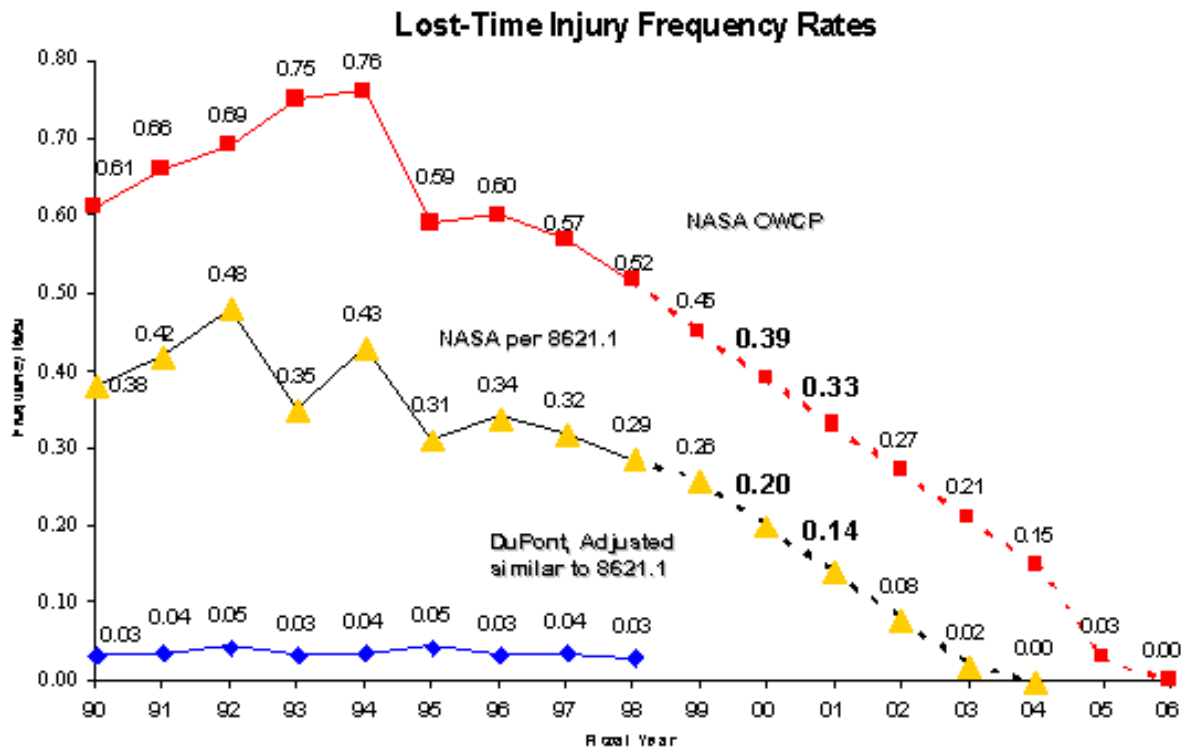
I will close by saying this, I want the NASA team to build on the successes I mentioned and find where we need to improve. I ask each of you to think about your responsibilities when it comes to -- look around this room -- protecting the lives and ensuring the safety of everyone at NASA. Thank you very much.

Current Agency Safety & Health Metrics

**NASA's Safety Performance Lost Time Cases per 100 Employees
(Data from Department of Labor)**



FY 2000/2001 Goals



OWCP is Department of Labor Data.